Frontiers in Dentistry

In Vitro Bacterial Leakage at the Implant-Abutment Connection of Two Dental Implant Systems with Internal Connection

Azadeh Khajavi[1], Shabnam Mohseni[2], Amir Peymani[3], Mehrak Amjadi[4*]

1. Department of Prosthodontics, School of Dentistry, Qazvin University of Medical Sciences, Qazvin, Iran
2. Student Research Committee, Qazvin University of Medical Sciences, Qazvin, Iran
3. Medical Microbiology Research Center, Qazvin University of Medical Sciences, Qazvin, Iran
4. Department of Prosthodontics, Dental Caries Prevention Research Center, Qazvin University of Medical Sciences, Qazvin, Iran

Article Info

Article type:
Original Article

Article History:
Received: 14 Apr 2020
Accepted: 23 Nov2020
Published: 8 Dec 2020

**** Corresponding author:***
Department of Prosthodontics, Dental Caries Prevention Research Center, Qazvin University of Medical Sciences, Qazvin, Iran

Email: mehrak.amjadi@gmail.com

A B S T R A C T

Objectives: Bacterial leakage at the implant-abutment interface is one of the main causes of peri-implant inflammation. One of the factors that influences bacterial leakage is the structural design of the interface. Considering the limited studies that have examined slip-joint connections, a comparative study of bacterial leakage was performed on two different systems namely Zimmer (Tapered Screw-Vent, Zimmer Dental) with slip-joint connection and Argon (Konus K3pro, Argon Implants) with conical connection.

Materials and Methods: Twenty-two implants were selected in 2 groups (11 Zimmer with slip-joint connection, and 11 Argon with conical connection) with similar platforms. Escherichia coli (E. coli) suspension (2 µL) was pipetted into the internal lumen of implants. The abutments were screwed onto the implants with a closing torque of 30 Ncm. The assemblies were placed in culture broth for 6, 24, 48 and 72 h, and 7 and 14 days. The colonies were counted and analyzed by the Mann-Whitney test (a=0.05).

Results: Microleakage was observed in 20% of the samples of conical connection group after 6 h to 2 days, and in 50% of the samples in slip-joint connection group after 3 to 7 days. There was a significant difference in bacterial leakage rate between the two implant groups (P<0.001) but no significant difference was seen in bacterial leakage over time (P>0.05).

Conclusion: Type of connection had a significant effect on bacterial leakage, but the rate of bacterial leakage did not significantly change over time.

Keywords: Dental Implants; Dental Leakage; Bacterial Load; Dental Implant-Abutment Design

➢ **Cite this article as:** Khajavi A, Mohseni Sh, Peymani A, Amjadi M. In Vitro Bacterial Leakage at the Implant-Abutment Connection of Two Dental Implant Systems with Internal Connection. *Front Dent.* 2020; 17: 32. doi: 10.18502/fid.v17i32.5196

INTRODUCTION

In recent years, implant-supported restorations have been widely recognized as the first choice for rehabilitation of edentulous areas due to their optimal esthetics and high success rate [1]. Success in implant therapy depends on the balance between the biological and mechanical factors [2]. Mechanical factors, such as the implant-abutment precise fit, are involved in the success of dental implant rehabilitation [3-5]. Implant-abutment connection misfit also affects the biological factors. The success of dental implants firstly depends on the osseo-integration phenomenon and secondary, preservation of the supporting bone [6-8].